Hyperacute Stroke Management: The New Era

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McMaster University | MacNeurology
Excellence in Care, Education, and Research

Hyperacute Stroke Management: The New Era

Objectives

After this session participants will be able to understand:

1. Time is Brain - The New Era
2. Identification of Patients for Stroke Transfer
3. The Important Role of the Paramedic at the Scene
4. The Factors that Improve Stroke Treatment Times
5. Improving Door in to Door Out Time

McMaster University

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2. **Unlabeled / Unapproved Use Disclosure - None**

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1994

TIA

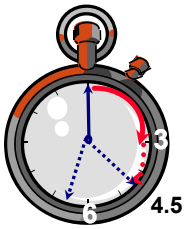
Clinical Assessment
Neurological Referral
Tests Arranged
Neurosurgical Referral

Stroke

Triaged by paramedics
Admitted to the ER
Admitted to general medical floor
Rehabilitation Referral
Long Term Care "bed blocker"

Acute Stroke Care: A Shift in the Treatment Paradigm

Time Is Brain



- ☐Stroke is treatable
- ☐Short window of opportunity
- ☐Treatment requires stroke expertise and carries a risk
- ☐Organized stroke care improves outcome

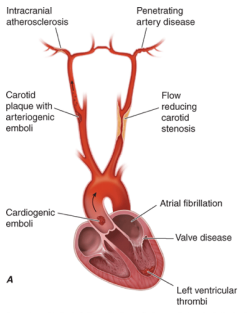
2019

TIA

Stroke Prevention Clinics
Carotid Pathway
Expedited Assessment
Expedited Investigations
Advanced Imaging

Stroke

Paramedic Prompt Card
Thrombolysis Program
Clot Retrieval Program
Stroke Unit Care
Integrated Stroke Program
Regional Stroke Program



Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: www.accessmedicine.com
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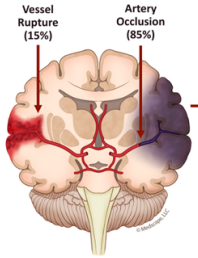
Stroke Etiologies

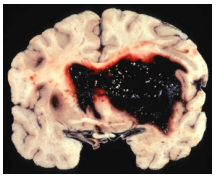


Etiology	%
Atherothrombotic Stenotic artery feeding area of infarction	25-30
Cardioembolic A thrombus or other material dislodges from the heart or aortic arch	20
Lacunar/Small Vessel Small; deep infarct	15-20
Other/Uncommon	5-10
Cryptogenic Unknown cause	25-30

Adams HP Jr, et al. *Stroke*. 1993;24:35-41; Foulkes MA, et al. *Stroke*. 1988;19:547-554.

Intracerebral Hemorrhage

- 10 - 20 percent of stroke
- 30 day mortality 30-50%
  - > 60% for anticoagulant associated ICH
- Functional independence at 6 months
  - Only 2o%



Etiology

Medical

Hypertensive ICH

Lobar ICH – amyloid angiopathy

Anticoagulant associated ICH

Hemorrhagic transformation of cerebral infarction

Surgical

Subdural (traumatic or anticoagulant related)

Aneurysmal subarachnoid hemorrhage

Arteriovenous malformations

Other

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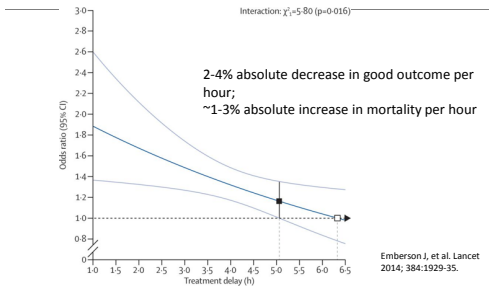
"Stroke Alert"

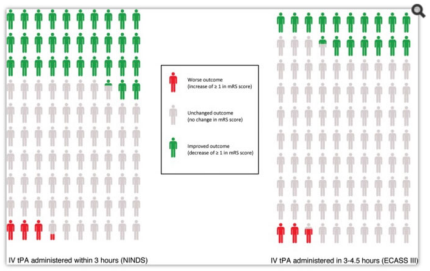
Acute Stroke Protocol

IV tPA: Time-benefit interaction



2-4% absolute decrease in good outcome per hour;
~1-3% absolute increase in mortality per hour

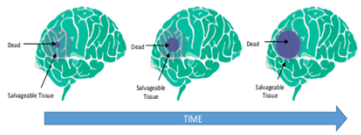
Emberson J, et al. Lancet 2014; 384:1929-35.



Number needed to treat to benefit and harm per 100 patients treated with intravenous recombinant tissue-type plasminogen activator (IV tPA) for

Time is Brain

- 1,900,000 brain cells die every minute blood supply is cut off to the brain
- "Every minute saved in onset-to- treatment granted on average 4.2 days of extra healthy life" (Meretoja et al.,2017, p. 2123)
- "The ischemic brain ages 3.6 years each hour without treatment" (Saver ,2006, p. 263)
- 3 – 5% decrease in good outcome with each minute delay
- Every 30 minute delay in reperfusion is associated with a 10% relative decrease in the probability in a good clinical outcome (mRS 0 – 2)



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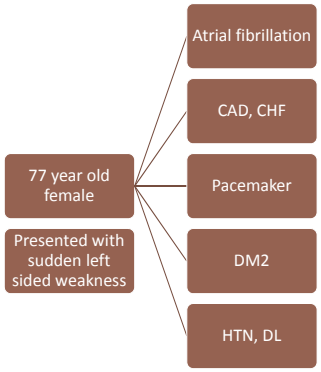
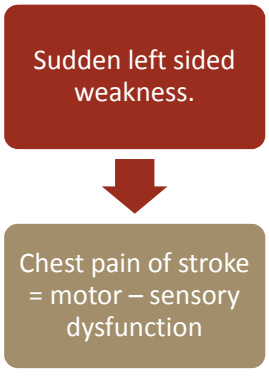
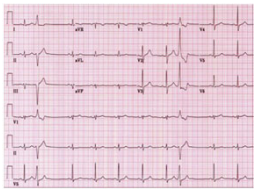
Lily







EKG of Stroke

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1a. Level of Consciousness (LOC)	**0**	Alert	**9. Limb Ataxia**	**0**	Absent (or in coma)
	1	Drowsy		1	Present in 1 limb
	2	Stuporous		2	Present in 2 or more limbs
	3	Comatose			
1b. LOC Questions	**0**	Answers both questions correctly	**10. Sensory**	0	Normal
	1	Answers one question correctly		1	Partial loss
	2	Answers neither question correctly		**2**	Dense loss (or in coma)
1c. LOC Commands	**0**	Performs both tasks correctly	**11. Best Language**	**0**	No dysphasia
	1	Performs one task correctly		1	Mild
	2	Performs neither task correctly		2	Severe dysphasia
				3	Mute
2. Best Gaze	**0**	Normal	**12. Dysarthria**	**0**	Normal articulation
	1	Partial gaze palsy		1	Mild – moderate dysarthria
	2	Forced deviation		2	Unintelligible or worse
3. Visual Fields	0	No visual loss (or in coma)	**13. Neglect**	0	No neglect (or in coma)
	1	Partial hemianopia		1	Partial neglect
	2	Complete hemianopia		**2**	Complete neglect
	3	Bilateral Hemianopia			
4. Facial Palsy	0	Normal	**NIHSS Total Score**	17	
	1	Minor			
	2	Partial			
	3	Complete			
5. Best Motor RIGHT ARM	**0**	No drift			
	1	Drift			
	2	Some effort against gravity			
	3	No effort against gravity			
	4	No movement			
6. Best Motor LEFT ARM	0	No drift			
	1	Drift			
	2	Some effort against gravity			
	3	No effort against gravity			
	4	No movement			
7. Best Motor RIGHT LEG	**0**	No drift			
	1	Drift			
	2	Some effort against gravity			
	3	No effort against gravity			
	4	No movement			
8. Best Motor LEFT LEG	0	No drift			
	1	Drift			
	2	Some effort against gravity			
	3	No effort against gravity			
	4	No movement			

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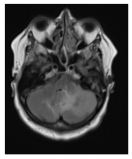

= Troponin Of Stroke

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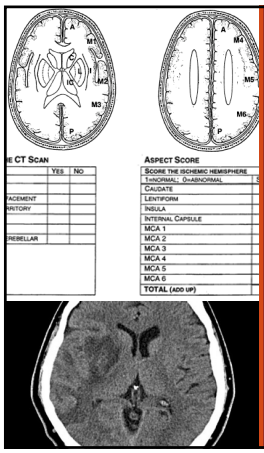

Aspect Scoring

Stroke Mimics and Chameleons

Mimic
- Neurological or Medical Disorders that Look Like Stroke

Chameleon
- Stroke Disorders that Don't Look Like Stroke

Most Stroke Presents:
- Suddenly
- Focal Motor or Sensory Symptoms and Signs
- Speech and Language Disturbance